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Civil & Structural
Geotechnical & Environmental
Traffic & Highways
Drainage & Infrastructure

Flood Risk Assessment & Drainage Strategy

Proposed re-development of brownfield site to self-storage unit at:

Tunbridge Wells MOT Centre and the Former Oil Distribution Depot, North Farm Road, Tunbridge Wells, Kent, TN2 3DP

Client: CSS TW Asset Limited

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Table of Contents

Appendix

A. Architect's Proposed Site Layout
B. Environment Agency Flood Map
C. Southern Water Asset Search
D. Topographical Survey Including Existing Drainage
E. Greenfield Runoff Rate Calculation
F. Microdrainage Preliminary Storage Volumes Calculations
G. Proposed Drainage Principles - Schematic
H. Surface Water Drainage Maintenance Plan
I. Kent County Council LLFA – Drainage Strategy Summary Form

1. Introduction

1.1 Background

This report has been prepared on the instruction of CSS TW Asset Limited to accompany a planning application for the proposed self-storage unit on North Farm Road, Tunbridge Wells, to the western side of the Borough of Tunbridge Wells in Kent. The report discusses potential flood risk, existing surface water drainage and goes on to describe the proposed layout and proposals for managing surface water runoff from the site.

1.2 Site Location

The site is located within the suburb of High Brooms in Royal Tunbridge Wells. It is located at the intersection of North Farm Road and Chapman Way, to the north of High Brooms train station, at National Grid Reference 559429, 141573, and covers a total area of 0.479 hectares. The site currently comprises a single building housing an MOT testing centre, along with various areas of hardstandings currently used for car storage.

1.3 Proposed Development

The development proposal for the site comprises of a three/four-storey storage facility along with an external loading/parking area in the southern portion of the site. The proposed site plan by DMWR Architects Limited is enclosed in Appendix A.

1.4 Ground Conditions

A previous site investigation carried out at the site in July 2016 shows contamination within the made ground soils on the site, with these soils deemed as 'hazardous waste' if removed from site. This contamination likely came from the sites previous use as an oil storage and distribution depot.

Within this site investigation, groundwater levels were recorded at depths of between 3.6m and 4.9m below ground level. Further site investigation is due to take place specific to this development.

1.5 Report Structure

Following this introductory section:

- Section 2 describes the planning policy context within which the proposals will be assessed;
- Section 3 discusses the potential sources of flooding for the site;
- Section 4 summarises a surface water management strategy for the site, considering any existing site drainage, the proposed point of discharge and the appropriateness of Sustainable Drainage Systems (SuDS);
- Section 5 deals with any requirement for foul water drainage;

- Section 6 offers a summary and conclusions

2. Relevant Policy and Guidance

2.1 National Planning Policy

With regard to flood risk the National Planning Policy Framework (NPPF) requires that:

"Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere."

The NPPF sets out that the Sequential Test should be applied to steer development to the areas of lowest probability of flooding and states that development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding.

To establish the appropriateness of development at a specific site the NPPF refers to the Flood Zones, which are shown on the Environment Agency Flood Map, and establishes the range of uses which are appropriate, or compatible, land uses for each Flood Zone.

The Flood Zones can be summarised as follows:

- Zone 1: Low Probability. This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any one year. (<0.1%)

- Zone 2: Medium Probability. This zone comprises land assessed as having between 1 in 100 and 1 in 1000 annual probability of river flooding (1%-0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1%) in any year.

- Zone 3a: High Probability. This zone comprises land assessed as having 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

- Zone 3b: Functional Flood Plain. This zone comprises land where water must flow or stored in times of flood. Strategic Flood Risk Assessments should identify this zone.

According to the NPPF, if following the application of the Sequential Test it is not possible, consistent with wider sustainability objectives, for the development to be in zones of lower probability of flooding, the Exception Test can be applied.

As part of this process, it is necessary to consider the type and nature of the development. The Planning Practice Guidance: Flood Risk and Coastal Change defines the type and nature of different development classifications in the context of their flood risk vulnerability. This has been summarised in Table 2.1 below.

Table 2.1: Flood Risk Vulnerability and flood zone compatibility

Flood Risk Vulnerability	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Zone 1	√	√	Exception Test Required	√	√
Zone 2	Exception Test Required	√	Exception Test Required	√	√
Zone 3a	Exception Test Required	√	×	Exception Test Required	√
Zone 3b	Exception Test Required	√	×	×	×

√ Development is appropriate × Development should not be permitted.

2.2 Local Policy

Kent County Council Drainage and Planning Policy December 2019

Kent County Council are the Lead Local Flood Authority for the site location. As LLFA, KCC have a strategic overview of 'local flooding' for the site. Their local flood risk management strategy document was updated in December 2019.

This policy states that NPPF priorities apply, irrespective of the development scale.

KCC also refer designers to CIRIA SuDs Manual (C753) 2015, Building Regulations Part H, BS 8582:2013 COP for Surface Water Management for Development Sites, the UK SuDS Tools and the Environment Agency's Long Term Flood Risk map., all of which are considered within this Drainage Strategy document.

As the site area is less than 1 ha, and is situated in flood zone 1, a Flood Risk Assessment is not strictly required for planning purposes. This report is therefore primarily concerned with the management of surface water within the proposed development site, as required by KCC.

The KCC Drainage and Planning Policy document sets out 9 SuDS policies, follow the drainage hierarchy, deliver effective drainage design, maintain existing drainage flow paths & watercourses, seek to reduce and avoid existing flood risk, drainage sustainability and resilience, sustainable maintenance, safeguard water quality, design for amenity and multi-functionality and enhance biodiversity. These SuDS policies will all be addressed as part of this Drainage Strategy report.

Specifically, the policy requires the drainage system be designed to operate without any flooding during any rainfall event up to (and including) the critical 1 in 30 year storm, and to accommodate the rainfall generated by events of varying durations and intensities up to (and including) the critical, climate change adjusted, 1 in 100 year storm without any on-site

property flooding and without exacerbating the off-site flood-risk. FEH data should be used in any assessment of rainfall runoff.

A controlled flow rate of 2 l/sec should be considered the minimum rate to be set for small sites, to avoid the potential for blockages at the flow control.

For 'brownfield' sites, the peak runoff rate must be as close to the greenfield runoff rate from the development as reasonably practicable.

Access should be maintained into and through the site for emergency vehicles during all storms up to (and including) the critical, climate change adjusted 1 in 100 year event.

KCC require that the drainage design accommodates the 1 in 100 year storm with a 20% allowance for climate change, with an additional analysis undertaken to understand the flooding implication for a greater climate change allowance of 40%.

The drainage system must be designed to take account of the construction, operation and maintenance requirements of all components, and a maintenance plan is required indicating a schedule and time of activities to ensure the system continues to operate effectively.

The simplified index method within chapter 26 of the CIRIA SuDS Manual should be followed to ensure appropriate mitigation of pollution hazards.

The completed Kent County Council Drainage Strategy Summary Form is included in Appendix I.

Tunbridge Wells Stage 1 Surface Water Management Plan October 2013

A Stage 1 SWMP was undertaken by Kent County Council in October 2013 as part of their remit for strategic oversight of local flood risk management in Kent. Tunbridge Wells had been identified as an area potentially at risk of local flooding in a 2011 Preliminary Flood Risk Assessment.

The area of High Brooms is located within Drainage Area DA01 'Tunbridge Wells' of this report. Appendix B Section DA01 notes the following with regards to Flood Risk specifically in the High Brooms areas (incidences near the development site on North Farm Road are highlighted in bold):

Receptor	Source	Pathway	Historic Evidence
High Brooms	Heavy rainfall resulting in surface water run off and overloaded sewers	Southern Water sewers (Dowding Way, Lakeman Way, Lamberts Road, North Farm Lane/Road)	Reports of water gushing from an underground source at Clifton Road.

	Surface water (blocked drains/gullies	Unnamed Drains, Somerhill Stream	Sewer flooding recorded in 2008, 2011, 2012.
	Groundwater	Lakeman Way, Newlands Road, North Farm Road, Roundabout Wood, Silverdale Road, St Michaels Road, The Fairways, Upper Grosvenor Road, Sandhurst Road and South View Road.	Fluvial flooding caused by lack of capacity in unnamed drains and the Somerhill Stream.
	Fluvial	FMfSW follows again the line of unnamed drains and the Somerhill Stream, there is some isolated ponding within High Brooms, the Ambulance Station is potentially at risk from a flow route which follows Silverdale Road.	There are events recorded on all roads identified. Regular flooding has been described on Lakemans Way, North Farm Road and Upper Grosvenor Road.

Appendix C of the SWMP contains a Flood History Table with further information on each event. There are three events associated with North Farm Road:

1. 2009, Source: surface water, Records show that water was flowing down the road for around 2 weeks and that it contained Chlorine, flow rate was reported as approximately 5 litres/minute.
2. Undated, Source: sewer, EA completed an investigation into misconnections in the area.
3. 2012, Source: surface water with blocked gullies/drains, KCC was requested to clear chamber and jet lines through to next gully/drainage asset.

Historic incidences of flooding to roads nearby to the site appear to have been caused by a lack of capacity and/or maintenance of the drains/sewers serving the area. This situation will be unaffected by the proposed development.

3. Potential Sources of Flooding

3.1 Fluvial and Tidal Flooding

The Environment Agency flood map in Figure 3.1 below shows that the site is entirely located within flood zone 1. The flood map is repeated in full in Appendix B. This means that the site is at very low risk of river and sea flooding. Based on this flood zone allocation, a Flood Risk Assessment is not strictly required for planning purposes. This document is therefore primarily concerned with the management of surface water within the proposed development site.

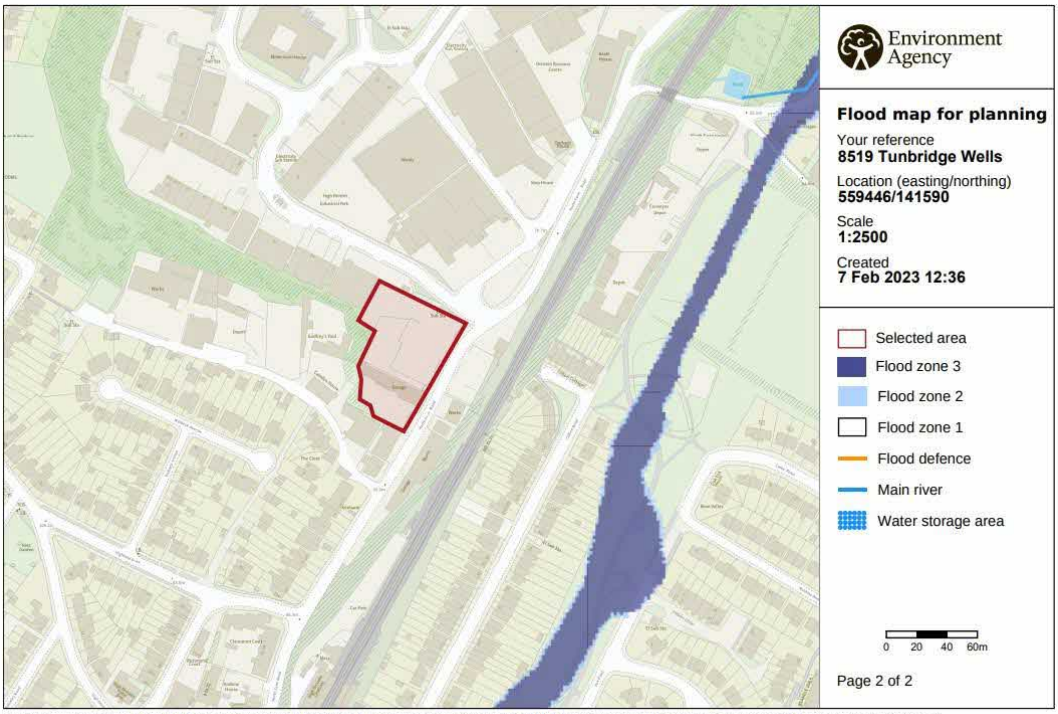


Figure 3.1 Flood Map for Planning (Courtesy of gov.uk)

The proposed building is to be used for self-storage, which has a flood risk vulnerability classification of 'less vulnerable'. Using Table 2.1 above, this usage is compatible with the flood zone within the site for all areas, with no exception test required.

The risk to the proposed development from fluvial flooding is therefore considered to be very low.

3.2 Flooding from Land (Overland flow & Surface Water Flooding)

The Environment Agency's surface water flood risk map is shown in figure 3.2. This shows some areas of 'low risk' flooding within the site, which is flooding with a maximum depth of

below 300mm. These areas are isolated and are will be dealt with by the provision of a new site surface water drainage network, designed and constructed to modern standards. There are no areas of the development site which are shown to have a medium or high risk of flooding from surface water (ie greater than 300mm).

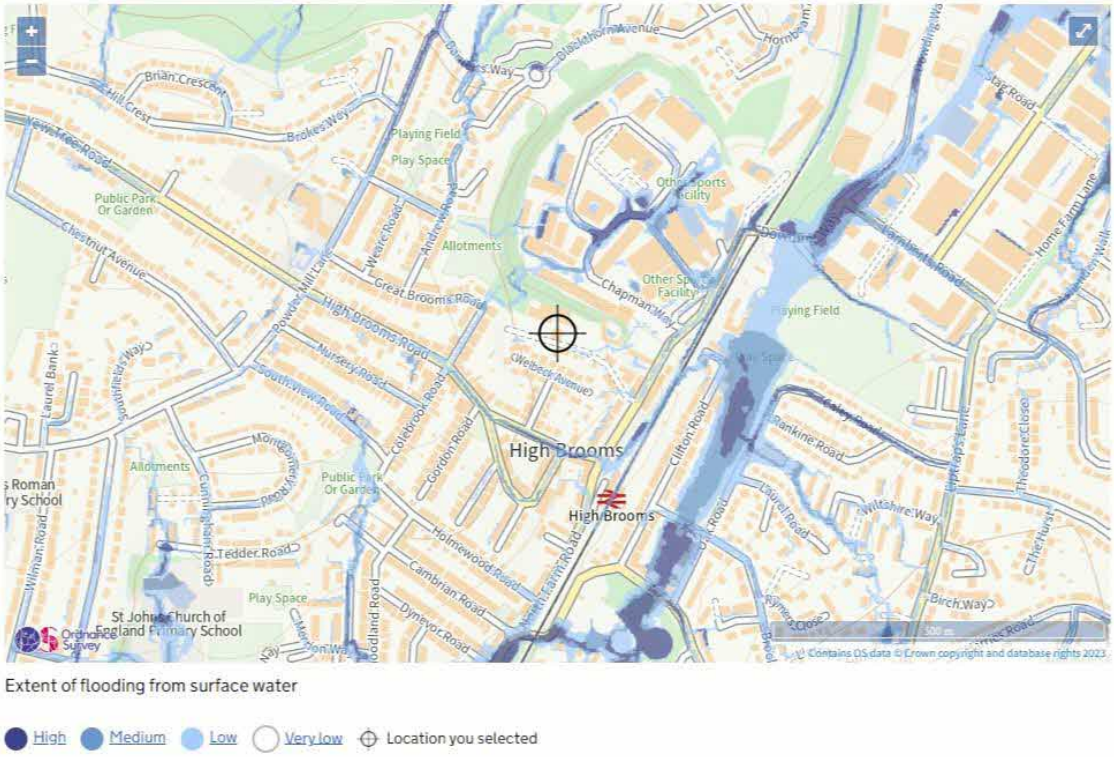


Figure 3.2 Surface Water Flooding Extent Map (Courtesy of gov.uk)

Overall, the risk to the development from overland surface water flooding is considered to be very low.

3.3 Ground Water Flooding

Mapping from the British Geological Survey shows the site to be underlain by the Tunbridge Wells Sand Formation, a sedimentary bedrock comprising sandstone and siltstone interbedded. No superficial deposits are recorded at the site location. The maps are reproduced in Figures 3.3 and 3.4 below.

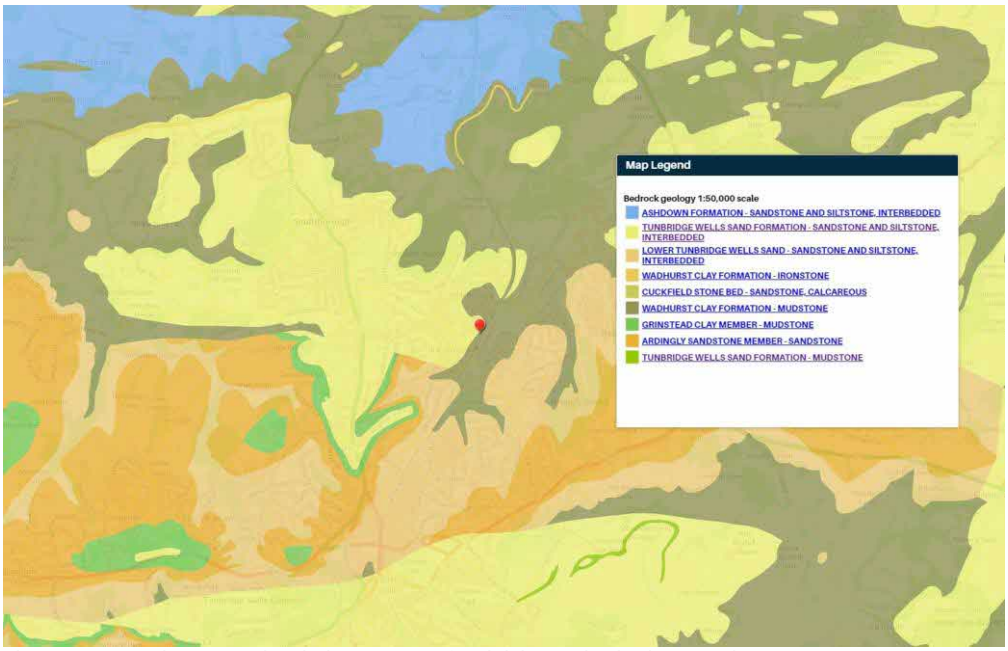


Figure 3.3 Geology - Bedrock (Courtesy of British Geological Survey)

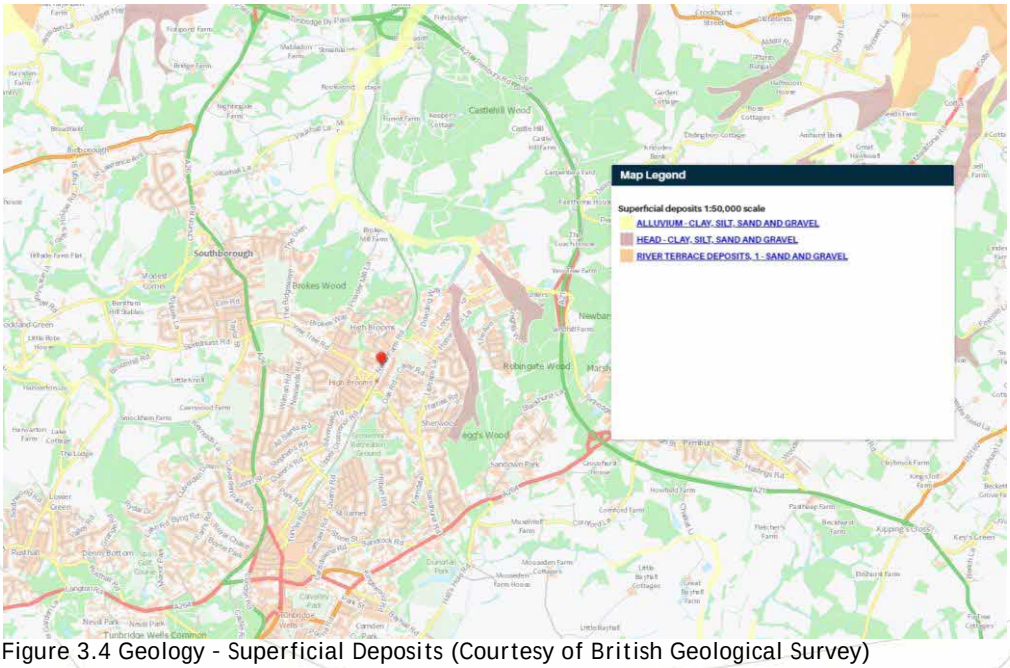


Figure 3.4 Geology - Superficial Deposits (Courtesy of British Geological Survey)

Groundwater vulnerability maps have been reviewed to determine the aquifer designations and vulnerability of groundwater to pollution.

Bedrock at the site has an aquifer designation of 'Secondary A'. The bedrock aquifer designation map is provided in Figure 3.5. Secondary A aquifers consist of permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

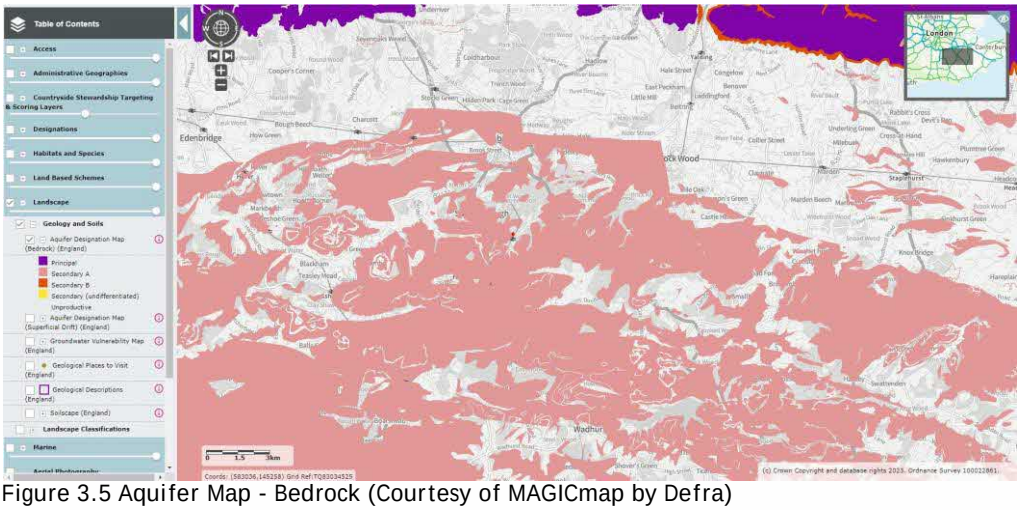


Figure 3.5 Aquifer Map - Bedrock (Courtesy of MAGICmap by Defra)

There is no superficial drift aquifer designation for the site.

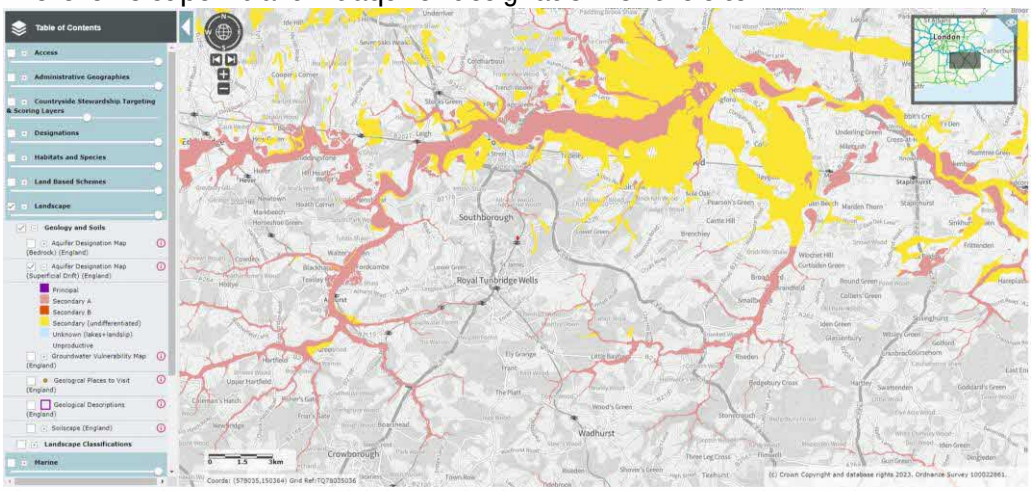


Figure 3.6 Aquifer Map - Superficial Deposits (Courtesy of MAGICmap by Defra)

The site is located to the edge of an area categorised as groundwater having high vulnerability. These are areas that can easily transmit pollution to groundwater.

The adjacent area is categorised as unproductive. These areas are considered to consist of bedrock or superficial deposits with low permeability that naturally offer protection to any aquifers that may be present beneath.

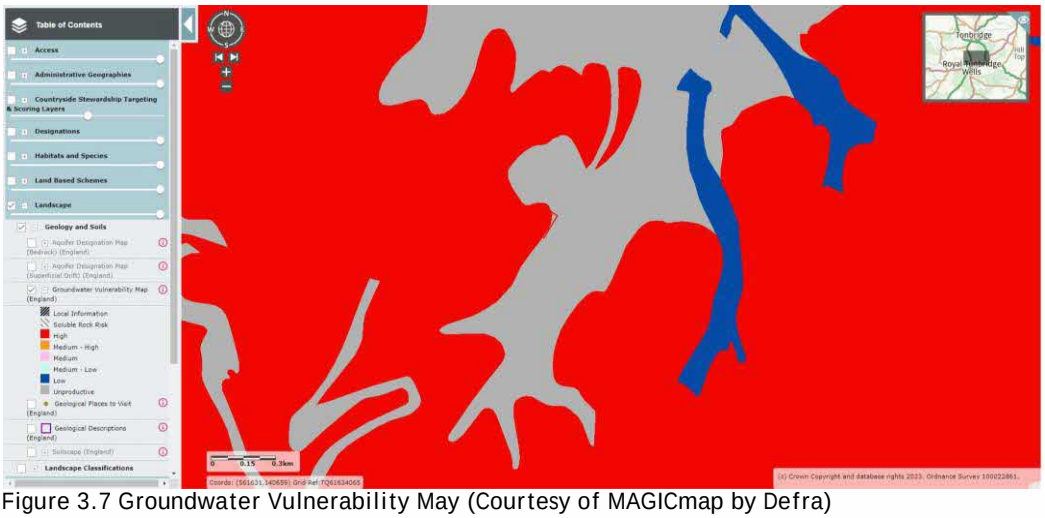


Figure 3.7 Groundwater Vulnerability May (Courtesy of MAGICmap by Defra)

A predicted result of climate change is wetter winters that may lead to increased groundwater levels and as such potentially increasing the risk of groundwater flooding. A previous site investigation carried out at the site in July 2016 shows groundwater levels recorded at depths of between 3.6m and 4.9m below ground level. Further site investigation is due to take place specific to this development.

The risk to the development from rising groundwater levels is currently considered to be low, but is subject to future site investigation.

3.4 Flooding from Man-made Drainage Systems

Local drainage can result in substantial damage and distress to residents and business owners if not managed carefully. Flooding from artificial drainage systems may occur at the site from blocking or overloading of pipes or sewers or failure of pumping systems. Sewers and surface water drains are often very old and generally designed to a lower standard, such as a 1 in 10 year standard. As a result, the flood risk associated with sewer flooding is generally higher in long-established urban areas than from other sources, although the consequences are usually limited in extent.

Surface water flows off site will be restricted. In addition, any new foul water sewerage and surface water systems for the development will be designed to meet modern standards. Downstream connection points will be checked for condition and suitability. This should ensure that the systems have sufficient capacity to prevent overloading under the normal range of operating conditions. A maintenance plan for the site drainage will be in place to ensure that the system remains operational.

The annual flood risk from new artificial drainage systems should therefore be low.

3.5 Flooding from Reservoirs, Canals and other Artificial Sources.

Non-natural or artificial sources of flooding can include reservoirs, canals and lakes where water is retained above natural ground level, operational and redundant industrial processes including mining, quarrying and sand and gravel extraction, as they may increase floodwater depths and velocities in adjacent areas. The potential effects of flood risk management infrastructure and other structures also need to be considered. Reservoir or canal flooding may occur as a result of the facility being overwhelmed and/or as a result of dam or bank failure.

The Environment Agency's flood risk from reservoirs map shows that the site is not at risk from flooding from reservoirs, canals or other artificial sources.

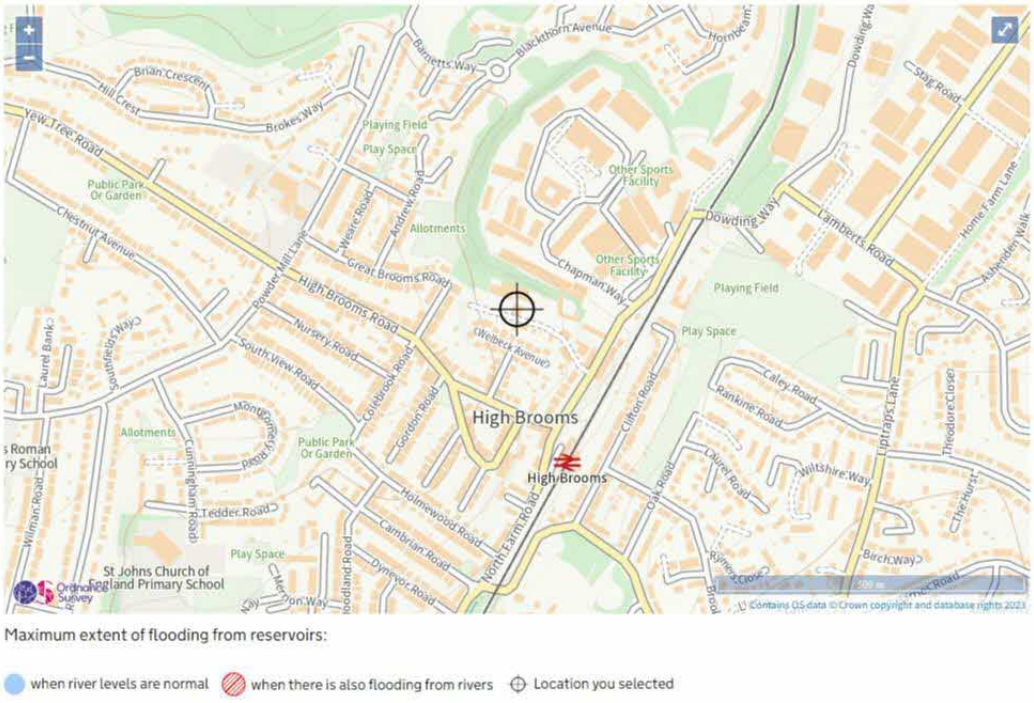


Figure 3.12 Extent of flooding from reservoirs (Courtesy of gov.uk)

Flood risk from reservoirs, canals and other artificial sources is considered to be very low.

3.6 Flood Risk Summary

As can be seen from the various searches and the maps above, the proposed site is located within Flood Zone 1. The proposed development has been assessed as appropriate for its

location, and the overall risk to the development from fluvial flooding is assessed to be very low.

There is no significant risk from overland surface water flooding or groundwater flooding. Flood risk from man-made drainage systems and other artificial sources such as canals or reservoirs is also considered to be very low.

The management of surface water to prevent flooding to both the development site and immediate surrounding area due to surface water drainage will be discussed in section 4.

4. Surface Water Management Strategy

4.1 Existing Surface Water Drainage

The existing site is covered with either hardstanding or roof, with hardstanding drained using gullies and drainage channels. Several oil interceptors are present on site to serve the sites previous use as an oil storage and distribution depot, MOT centre and subsequent vehicle storage. There is currently a small portion of green space against the north-west boundary of the site where a soft landscape slope is present, sloping up to the adjacent plot. The area of existing hardstanding is 4,493m^2 (0.45 ha).

The existing site drainage network has been surveyed, and drawing S23829-U rev A by Survey & Engineering Projects is included within Appendix D.

Existing surface water drainage is evident on site, in the form of gullies and drainage channels and petrol interceptors. Unfortunately due to the condition of the existing drainage the outfall location was not established, but flow direction is towards the north-east of the site, where existing surface water adopted sewers are located running north within North Farm Road. It is assumed that the existing site surface water drainage network connects into these adopted sewers at the intersection of Chapman Way and North Farm Road. There are no flow control devices or storage methods currently evident to the existing site.

Southern Water sewer records are included in Appendix C and show both surface and foul water adopted sewers are present within the surrounding roads (Chapman Way and North Farm Road). The site surface water drainage network is assumed to connect into Southern Water Manhole ref 4550 or 5651, based on the direction of pipes exiting the site as established by survey.

4.2 Proposed Site Drainage

Section 1.1 of the SuDS Manual (Ciria C753) states the following:

- "Sustainable drainage systems (SuDS) can deliver multiple benefits. Surface water is a valuable resource, and this should be reflected in the way it is managed and used in the built environment. It can add to and enhance biodiversity, beauty, tranquillity and the natural aesthetic of buildings, places and landscapes and it can help make them more resilient to the changing climate.
- The philosophy of sustainable drainage systems is about maximising the benefits and minimising the negative impacts of surface water run-off from developed areas.
- The SuDS approach involves slowing down and reducing the quantity of surface water runoff from a developed area to manage downstream flood risk and reducing the risk of that runoff

causing pollution. This is achieved by harvesting, infiltrating, slowing, storing, conveying and treating runoff on site and, where possible, on the surface rather than underground. Water then becomes a much more visible and tangible part of the built environment, which can be enjoyed by everyone."

- The SuDS Manual describes the four pillars of SuDS design as Water Quality, Water Quantity, Amenity and Biodiversity as illustrated in Figure 5.1 below which is a representation of The SuDS Manual Figure 2.1.

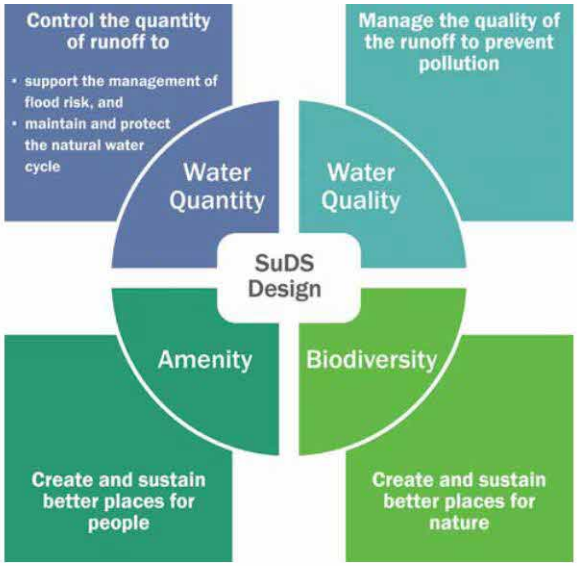


Figure 4.1: Extract Representation of Figure 2.1 of The SuDS Manual

The drainage system and ground levels will be designed such that:

- Flooding does not occur during a 1 in 100-year storm event (including allowance for up to 40% increase to allow for the anticipated impacts of climate change) in any part of a building or in any utility plant susceptible to water within the development.
- Flows resulting from rainfall in any event exceeding the 1 in 100-year rainfall event are managed in exceedance routes to minimise as far as practicable the risk of flooding to people and property both on and off site.
- Flows from pavements will flow directly onto the soft landscaping.
- The management of surface water on site will ensure that there is no increased risk of flooding on and offsite as a result of the development.
- The SuDS design for the development site should ensure that the quality of any receiving water body is not adversely affected and preferably enhanced in accordance with Ciria SuDS Manual, Chapter 4.

4.2.1 Proposed Discharge Route

NPPF Planning Practice Guidance Paragraph 080 states that:

"Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:

1. into the ground (infiltration);
2. to a surface water body;
3. to a surface water sewer, highway drain, or another drainage system;
4. to a combined sewer."

The use of soakaway or infiltration systems

In relation to route option 1) infiltration, the Drainage and Planning Policy Document by Kent County Council states that discharge to the ground shall only occur within clean, competent natural and uncontaminated ground.

With the limited information available, the British Geological Mapping information suggests that the site is underlain by Tunbridge Wells Sandstone Formation comprising sandstone and siltstone interbedded. The bedrock has a Secondary A aquifer designation. There are no superficial drifts present on site.

The area is categorised as groundwater having high vulnerability. These are areas that can easily transmit pollution to groundwater.

A previous site investigation carried out at the site in July 2016 shows contamination within the made ground soils on the site, with these soils deemed as 'hazardous waste' if removed from site. This contamination likely came from the sites previous use as an oil storage and distribution depot. Within this site investigation, groundwater levels were recorded at depths of between 3.6m and 4.9m below ground level. Further site investigation is due to take place specific to this development.

Due to the presence of contamination within the made ground on site, and the high groundwater vulnerability classification, it is considered that soakaway and infiltration techniques would not be appropriate for this site.

Discharge to a watercourse

There are no existing watercourses within proximity of the site, therefore this option is not considered appropriate for this site.

Discharge to an existing surface water sewer

It has been established that there are existing adopted surface water sewers within the surrounding roads (Chapman Way and North Farm Road), and that this is the likely route of existing surface water discharge from site. It is therefore proposed to

replicate this route and connect the proposed site to the existing surface water sewer within North Farm Road, with a proposed connection point at Southern Water manhole 4551.

Additionally, the discharge of some rainwater to a rainwater harvesting system has been considered, but is not considered viable in this circumstance as the proposed building will have minimal occupation and opportunity for re-use.

Therefore, following the hierarchy, the proposal for this site is to discharge as existing to the nearby adopted surface water sewer within North Farm Road. This is subject to agreement with Southern Water. A pre-development enquiry has been submitted.

4.2.2 Proposed Discharge Quantity

The peak flow rates from the existing site impermeable area for various storm return periods is shown below (unrestricted):

Storm return period	Rainfall intensity	Peak discharge rate
1 in 1 year	30.61 mm/hr	69.7 l/sec
1 in 30 year	97.68 mm/hr	210.0 l/sec
1 in 100 year	148.21 mm/hr	321.7 l/sec

However, it is proposed to restrict the surface water run off rate to Greenfield run-off rates. This has been calculated as a maximum of 7.87 l/sec. See calculation included within Appendix E.

The proposed impermeable area is to be reduced with the inclusion of soft landscaped areas, particularly around the north-east corner of the site. The proposed impermeable area of the site is 3,468m^2 (0.35 ha).

On-site storage will be provided to contain flows up to a storm with a return period of 1 in 100 years, with an allowance of an additional 40% for climate change. Runoff from all areas, including the building roof and car park/yard hardstandings, will collect within an underground storage tank. The required plan area is not available for a sub-base replacement type tank.

Drained areas, proposed restricted discharge rates, associated preliminary attenuation volumes (1 in 100 yr +40%cc) and proposed treatment methods are summarised below. The preliminary storage volumes calculations are included within Appendix F. A sketch showing the proposed control, location of surface water storage, and discharge routes is included within Appendix G:

- Drained area = 3,468 m^2
- Restricted discharge rate
  - 1 in 1 year storm = 2.10 l/sec
  - 1 in 30 year storm = 5.67 l/sec
  - 1 in 100 year storm+40%cc = 7.87 l/sec
- Max surface water storage volume req'd = 203.1 m^3
- Storage method Underground attenuation tank
- Discharge route Existing adopted surface water sewer
- Runoff treatment
  - Car park/loading area bypass separator
  - Roof catchpits to rainwater pipes

Levels of external areas will be set to slope away from buildings, to avoid the potential for surface water runoff from entering the building during extreme storm events.

The new on-site drainage network will be designed to Sewers for Adoption 7th Edition, with no pipes surcharging for a storm with a 1 in 2 year return period, and no surcharging of the drainage system as a whole for a storm with a 1 in 100 year return period + 40% cc.

The drainage infrastructure will therefore be designed with provision for exceedance and allowance for climate change. It is considered that the limitation on discharge with associated storm water storage will ensure that there will not be any increased flood risk to people or property in the downstream catchment.

4.2.3 Proposed Discharge Quality

For treatment purposes, the drainage will be divided into two networks; one serving hardstanding areas (car park), and one serving roof runoff.

Hardstanding areas (car park)

Hardstanding is defined as 'ground surfaced with a hard material for parking cars on'. All hardstanding areas are to go through an interceptor, which will remove all silts and oil based contaminants. A bypass separator will be specified to serve the car park/loading area. The

interceptor specified will be suitable for the required drained area, as summarised in the table below:

	Actual catchment area	Allowable drained area for product reference
NSBP003	802m^2	1670m^2

The proposed bypass separator is designed to treat the full flow from rainfall up to 6.5mm/hr, which equates to 99% of all rainfall events. In more extreme events, the first flush from the surface is typically the most contaminated. The runoff enters the unit where any solids present sink to the bottom and are retained in the first chamber. Oil and water are then passed through to the second chamber where they are partially separated. As rain water builds and the surface water entering the separator exceeds the design flow, further runoff is diverted to bypass the second chamber and exit the separator.

If the roof drainage were to be directed through the interceptor, a large proportion of the initial surface water runoff passing through the interceptor would be from the roof. This would have the effect of 'diluting' the most contaminated surface water runoff from hardstanding areas, potentially allowing silt and oil contaminants to bypass treatment. The bypass separator should therefore serve hardstanding areas only.

Using the Simplified Index Approach within Section 26 of The SUDS Manual (C753), commercial yard and delivery areas, non-residential car parking with frequent change, are considered to have a 'Medium' Pollution Hazard Level (Table 26.2). The following table shows the required pollution hazard indices for this situation, along with the indices provided by a bypass separator, and confirms that the separator provides appropriate mitigation:

	Total suspended solids (TSS)	Metals	Hydro-carbons
	Required Indices for Land Use		
'Medium' Pollution Hazard Level (Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospital, retail)).	0.7	0.6	0.7

	Provided mitigation indices		
Class 1 bypass separator	0.8	0.6	0.9

Roof area

Using Table 26.2 of C753, the roof runoff has a Pollution Hazard Level of 'Low'.
Hydrocarbon pollution will be minimal as the rainwater pipes will directly connect into the underground network. Due to the possibility of silt build-up on the roof during dry weather, catchpits are proposed at the base of all rainwater pipes. This will prevent silt from the roof entering and building up within the attenuation tank and the further downstream network.
This situation is assessed using the Simplified Index Approach below, which confirms that sufficient mitigation is proposed:

	Total suspended solids (TSS)	Metals	Hydro-carbons
	Required Indices for Land Use		
'Low' Pollution Hazard Level (Other roofs (typically commercial/industrial roofs))	0.3	0.2	0.05

	Provided mitigation indices		
Catchpits	0.4	0.2	0.2

Each drained area has been considered separately in respect of its Pollution Hazard Level and required SUDs Mitigation Indices, and the proposed treatment methods have been proven to be appropriate for each area, in accordance with section 26 of CIRA C753 The SUDs Manual. All appropriate measures have been incorporated to reduce the risk of silt and oil from the site surface water network entering the existing downstream sewer network.

4.2.4 Amenity and Biodiversity

The proposal includes a landscaping strategy designed by a Landscape Architect, and increased areas of greenspace compared to the existing site (along with an associated reduction in hard surfacing). It is therefore considered that improvement from the present will be achieved with regards to both amenity and biodiversity.

4.2.5 Maintenance

A surface water drainage maintenance plan is included within Appendix H.

5. Foul Water Drainage

A survey of the existing site drainage has established that the existing site drains north-east and exits site towards the intersection of Chapman Way and North Farm Road, presumably connecting at Southern Water Manhole 5601.

Southern Water sewer records are included in Appendix C and show both surface and foul water adopted sewers are present within the surrounding roads (Chapman Way and North Farm Road). The site foul water drainage network is assumed to connect into Southern Water Manhole ref 5601, based on the direction of pipes exiting the site as established by survey.

It is proposed to re-use this existing route, connecting indirectly to the adopted sewers via the existing foul drainage network within the site. However, the condition and level of the existing site drainage will need to be established. If deemed not suitable, a new direct connection will be made to the existing Southern Water manhole MH 5601.

The anticipated peak discharge rate of foul water for the new development is anticipated to be 1.51 l/sec, based on the discharge units method calculation below. This is subject to agreement with Southern Water. A pre-development enquiry has been submitted.

Self-storage Unit:

	DU	No.	Total (DU x No.)
WC	1.6	3	4.8
Washbasin	0.3	4	1.2
Kitchen sink	1.3	1	1.3
Dishwasher	0.4	1	0.4
Shower	0.4	1	0.4
Floor gully	1.0	1	1.0
			∑DU = 9.1

Q = k x √(DU) (k = 0.5 for intermittent use)
Q = 0.5 x √9.1
Q = 1.51 l/sec

6. Conclusion

The NPPF Technical Guide classifies the flood risk vulnerability of Storage Facilities as a less vulnerable use and Table 3 of the Technical Guide indicates that such development is compatible with the Flood Zones identified on site in the location of the proposed buildings.

All forms of flood risk to the site have been assessed and it has been determined that there is a very low risk of flooding to the proposed development.

The development proposals are in accordance with both National and Local Policy and Guidance relating to Flood Risk and Surface Water Management.

External ground levels will be designed to direct any surface water flow away from building thresholds.

The SuDS strategy will be developed as part of the detailed design to meet the following criteria:

- Unless an area is designed to hold and/or convey water, flooding will not occur on any part of the site for a 1 in 30-year rainfall event.
- Flooding does not occur during a 1 in 100-year storm event (including an allowance for a 40% increase in rainfall intensity due to climate change) in any part of a building or in any utility plant susceptible to water (e.g. pumping station or electricity substation) within the development.
- In order to achieve the above, sufficient storm water storage will be provided to manage the storm water discharging from site, using an underground storage tank.
- Flows resulting from rainfall in any event exceeding the 1 in 100-year rainfall event are managed in exceedance routes to minimise as far as practicable the risk of flooding to people and property both on and off site.
- The SuDS design for the development site should ensure that the quality of any receiving water body is not adversely affected and preferably enhanced in accordance with Ciria SuDS Manual C753, Chapter 4.

The surface water drainage solution hierarchy has been followed to establish a proposed discharge route for surface water runoff into the adjacent adopted surface water sewer within North Farm Road, as existing. This is subject to agreement with Southern Water. A pre-development enquiry has been submitted. The proposed impermeable area is less than that of the existing site as additional areas of soft landscaping are incorporated into the scheme. Surface water will be stored using an underground attenuation tank. The attenuation will be designed to accommodate storms with a return period of up to 100 years, with an additional allowance of 40% for climate change. The proposed total flow rate off-site is 7.87 l/sec. A sketch showing principles for routing and storing surface water runoff is included in Appendix G.

Surface water runoff treatment measures will be provided in the form of catchpits (serving roof runoff) and bypass separators (serving runoff from car park/loading area hardstandings).

Foul water will be connected indirectly into the Southern Water foul sewer at the intersection of Chapman Way/North Farm Road via the existing site drainage network. The proposed total peak flow rate off site is 1.51 l/sec. This is subject to agreement with Southern Water. A pre-development enquiry has been submitted.

Appendix A

Architect's Proposed Site Plan
3940-DMWR-A-PL-006 DRAFT 15/03/2023

0m 4m 8m 12m 16m 20m

1:200 @ A1 1:400 @ A3

Rev	Date	Version Description	Drn	Chk

By Room Name Legend

- BIKE STORE
- BIN STORE
- COMMS
- DIS WC
- OFFICE
- RECEPTION
- SHOWER
- STAFF ROOM
- STORAGE
- UNLOADING BAY
- WC

For detail landscaping proposals refer to Allen Scott drawing Landscaping GA 746-100-001

Indicative storage layout subject to subconsultant review. Fire strategy to be reviewed by fire consultant.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, refer to Designers Risk Assessment, note the following :

DRAFT 15/03/23

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

Client Logo

DMWR Architects
16-18 Hatton Garden
First Floor
London EC1N 8AT

Client
CCS TW Asset Ltd

Project Name
Self Storage High Brooms
North Farm Road, Tumbridge Wells

Drawing Title
Proposed Site Plan

Drawing Status	North
PLANNING	

Drawing Details	DMWR Job No.
	3940

Drawn By	Drawn Date	Checked By	Scale @ A1
CC	22/11/22	AB	1 : 200

Drawing Number	Status	Revision
3940-DMWR-A-PL-006		

ISO A1 Landscape

Appendix B

Environment Agency Flood Map

Flood map for planning

Your reference	Location (easting/northing)	Created
8519 Tunbridge Wells	**559446/141590**	**7 Feb 2023 12:36**

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following:**

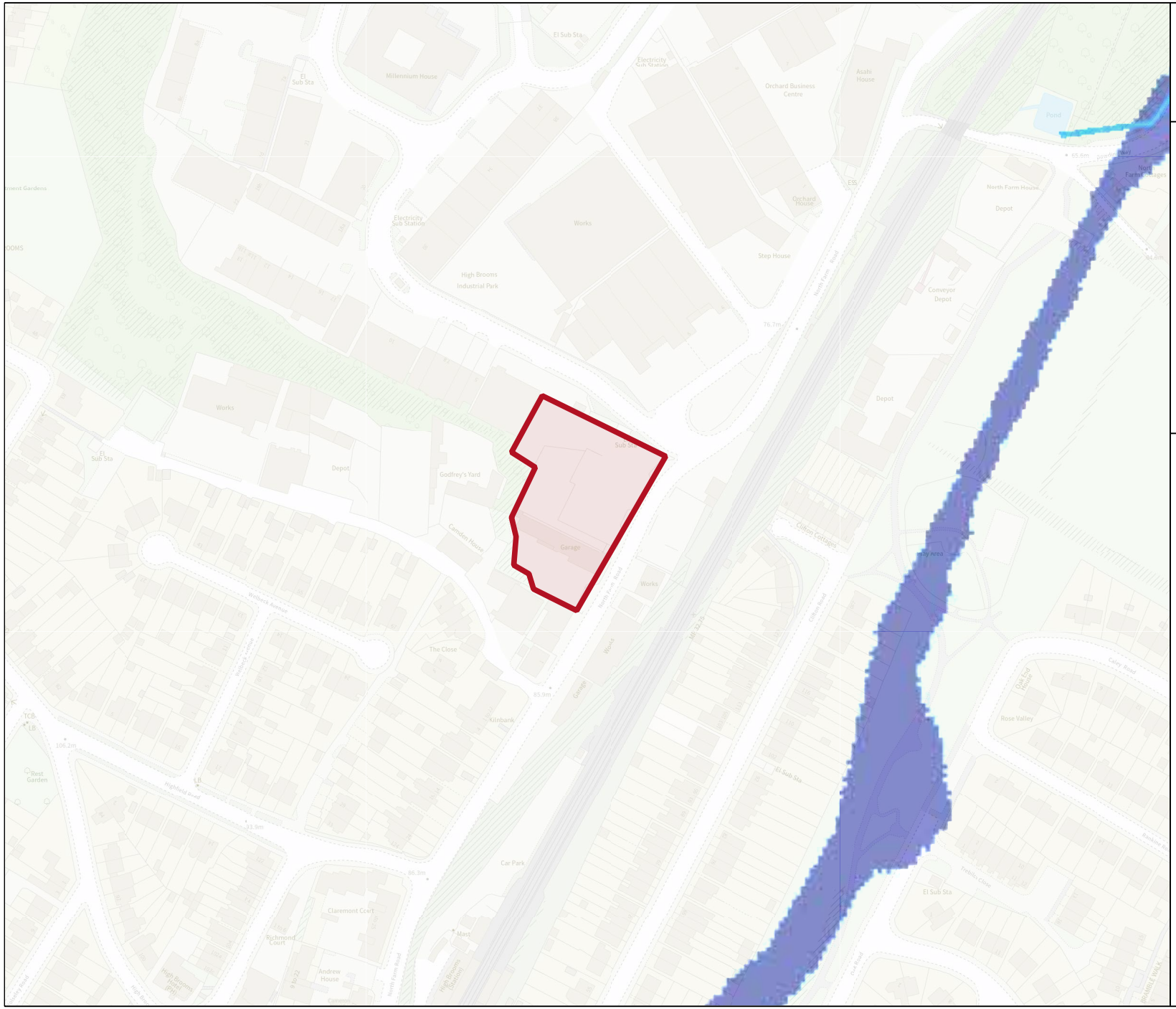
- bigger that 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence **which** sets out the terms and conditions for using government data. https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/



Environment Agency

Flood map for planning

Your reference
8519 Tunbridge Wells

Location (easting/northing)
559446/141590

Scale
1:2500

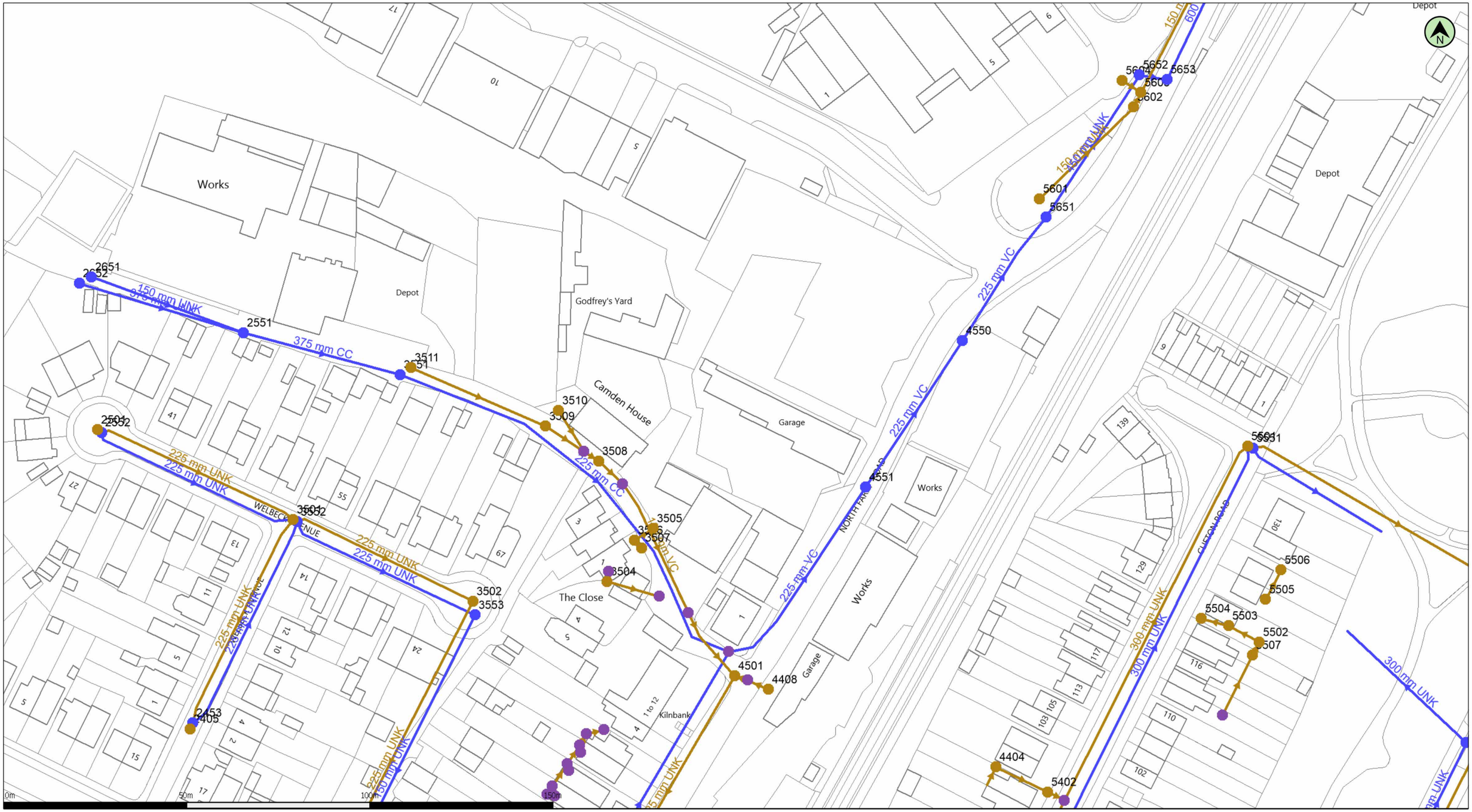
Created
7 Feb 2023 12:36

- Selected area
- Flood zone 3
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Water storage area

0 20 40 60m

Appendix C

Southern Water Asset Search



(c) Crown copyright and database rights 2023 Ordnance Survey 100031673 | Date: 24/01/23 | Scale: 1:1000 | Map Centre: 559422,141575 | Data updated: 06/01/23 | Our Ref: 1066033 - 1 | Wastewater Plan A3

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2023 Ordnance Survey 100031673 .This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.

Foul Gravity Sewer
Combined Gravity Sewer
Culverted Water Course or Treated Effluent
Surface Water Gravity Sewer
Rising Main, Vacuum or Syphon
Combined Outfall
Surface Water Outfall
Foul Outfall
Surface Water Inlet
Combined Pumping Station
Surface Water Pumping Station
Foul Pumping Station
WWTW Water Treatment Works
Section 104 Area
Building Over Agreement Area
Foul Manhole
Combined Manhole
Surface Water Manhole
Side Entry Manhole, Decarcation Chamber, Dummy Manhole or Surface Water Soakaway

[redacted]

Tunbridge Wells

WATER for LIFE from Southern Water

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
2405	F	0.00	0.00	
2501	F	99.86	0.00	
3501	F	96.79	94.86	
3502	F	94.01	0.00	
3504	F	0.00	0.00	
3505	F	0.00	0.00	
3506	F	0.00	0.00	
3507	F	0.00	0.00	
3508	F	0.00	0.00	
3509	F	0.00	0.00	
3510	F	0.00	0.00	
3511	F	0.00	0.00	
4404	F	0.00	0.00	
4408	F	0.00	0.00	
4501	F	86.36	83.87	
5402	F	0.00	0.00	
5501	F	69.66	0.00	
5502	F	0.00	0.00	
5503	F	0.00	0.00	
5504	F	0.00	0.00	
5505	F	0.00	0.00	
5506	F	0.00	0.00	
5507	F	0.00	0.00	
5601	F	78.88	75.83	
5602	F	77.27	74.27	
5603	F	77.16	74.10	
5604	F	77.16	74.99	
2453	S	0.00	0.00	
2551	S	97.94	96.52	
2552	S	99.86	98.26	
2651	S	100.24	98.42	
2652	S	0.00	0.00	
3551	S	94.11	93.27	
3552	S	96.79	0.00	
3553	S	94.01	0.00	
4550	S	0.00	0.00	
4551	S	0.00	0.00	
5551	S	69.66	68.44	
5651	S	79.07	76.16	
5652	S	77.24	74.32	
5653	S	76.80	74.05	
6452	S	70.35	67.03	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Appendix D

Topographical Survey Including Existing Drainage
Survey & Engineering Projects - S-23829-U rev A

N

PLAN GRID NORTH

File Name: S23829-U-RevA.dwg

LEGEND

AV	AIR VALVE
BT	BT INSPECTION COVER
CB	CONTROL BOX
CCTV	CCTV CAMERA POST
COM	COMMUNICATIONS COVER
CTV	CABLE TV COVER
DC	DRAINAGE CHANNEL
DP	DOWN PIPE
DR	DRAIN
EIC	ELEC INSPECTION COVER
ELB	ELECTRIC BOX
ER	EARTH ROD
EP	ELECTRICITY POLE
FL	FINISHED FLOOR LEVEL
FH	FIRE HYDRANT
G	GULLY
GLT	GROUND LIGHT
GST	GAS TAP
GSV	GAS VALVE
IC	INSPECTION COVER
IL	INVERT LEVEL
KO	KERB OUTLET
LP	LAMP POST
MH	MANHOLE
MKR	MARKER
OP	OUTFALL PIPE
PN	PYLON
PP	PETROL PUMP
RE	RODDING EYE
RWP	RAINWATER PIPE
SOF	SOFFIT LEVEL
SV	STOP VALVE
TCB	TELEPHONE CALL BOX
TL	TRAFFIC LIGHT
TLB	TRAFFIC LIGHT BOX
TP	TELEGRAPH POLE
WM	WATER METER
WO	WATER OUTLET
WST	WATER STOP TAP
WSV	WATER STOP VALVE
EOT	END OF TRACE
OSA	OUT OF SURVEY AREA
UTL	UNABLE TO LIFT
UTS	UNABLE TO SONDE
UTT	UNABLE TO TRACE
S/L	SIGNAL LOSS
BLK	BLOCKED
NFH	NO FURTHER GPR CONTACTS
BD	BACKDROP PIPE
NVP	NO VISIBLE PIPE
ToP	TOP OF PIPE
	EOT SYMBOL
	FITTING FROM RECORDS

BT	BT-A	BT-A
BT STAT RECORD	BT-D	BT-D
CABLE DUCT	DU-A	DU-A
CABLE DUCT STAT RECORD	DU-D	DU-D
CABLE TV	CA-A	CA-A
CABLE TV STAT RECORD	CA-D	CA-D
CCTV	CC-A	CC-A
CCTV STAT RECORD	CC-D	CC-D
TELECOMS	TC-A	TC-A
TELECOMS STAT RECORD	TC-D	TC-D
EARTH ROD STRIP	ER-A	ER-A
EARTH ROD STAT RECORD	ER-D	ER-D
ELECTRIC	EL-A	EL-A
ELECTRIC STAT RECORD	EL-D	EL-D
FIBRE-OPTICS	FO-A	FO-A
FIBRE-OPTICS STAT RECORD	FO-D	FO-D
FUEL LINE	FL-A	FL-A
FUEL LINE STAT RECORD	FL-D	FL-D
GPR DETECTION LINE	GPR	GPR
MAINS GAS	GM-A	GM-A
MAINS GAS STAT RECORD	GM-D	GM-D
MAINS WATER	WM-A	WM-A
MAINS WATER STAT RECORD	WM-D	WM-D
SEWER CW	CW-A	CW-A
SEWER CW STAT RECORD	CW-D	CW-D
SEWER FW	FW-A	FW-A
SEWER FW STAT RECORD	FW-D	FW-D
SEWER SW	SW-A	SW-A
SEWER SW STAT RECORD	SW-D	SW-D
TRAFFIC SIGNAL CABLE	TS-A	TS-A
TSC STAT RECORD	TS-D	TS-D
UNIDENTIFIED TRACE	UI-A	UI-A
UNIDENTIFIED CABLE	UC-A	UC-A
UNIDENTIFIED PIPE	UP-A	UP-A
VEHICLE DETECTION CABLE	VD-A	VD-A
VDC STAT RECORD	VD-D	VD-D
SURVEY BOUNDARY		
LIMITED/IMPEDED SURVEY		

QUALITY LEVEL

- A – Verification
- B1 – Horizontal/Vertical location using multiple techniques
- B2 – Horizontal/Vertical location using a single technique
- B3 – Horizontal location using a single technique
- B4 – Assumed route
- C – Site Reconnaissance
- D – Desktop utility records search

NOTES:

All levels relate to O.S (Newlyn) Datum, Established using network RTK. Survey plotted on a plane local grid, orientated to National Grid.

This Underground Utilities survey was conducted in compliance with the BSI PAS128:2014 standards.
Services linetypes display text indicating first an abbreviation of the services' function (eg. EL = Electric Cable) followed by the Quality Level to which that service was located (eg. B4 = Assumed route).

Quality Level descriptions shown in the above legend are for reference purposes only and are not intended as detailed descriptions.
For full information on Quality Levels, please consult the BSI PAS128:2014 standards document.

Lines annotated as GPR indicate a series of consistent subsurface anomalies located using the Ground Penetrating Radar and should be considered as Quality Level B2. The nature of these anomalies could not be determine by non-invasive means. GPR lines that were identifiable as a service are shown as their respective service.

DISCLAIMER:

At SEP we use skilled and experienced staff, modern up to date techniques and top of the range electromagnetic and radar technology to locate trace sub-surface utilities. However the performance of the equipment employed in non-invasive surveys can be adversely affected by factors outside the control of SEP. Therefore SEP cannot guarantee that all utilities present on site have been located. It is the responsibility of the Client to consult regional authority records and undertake trial digs where appropriate.

Where similar services run in close proximity it may be impossible to separately trace individual services as the trace signal can experience interference. In such cases, services will be shown as a single, annotated line The displayed depth will refer to the shallowest detected utility.

Successful tracing of non-conductive materials may be limited. Drainage gulleys are dye tested where possible to prove connectivity but it is not always possible to introduce the sonde due to narrow pipe sizes and/or accumulated silt.

Depth information of underground services/features are generally accurate to within +/- 10% (i.e. a pipe at 2m deep may be accurate to +/-200mm) but this cannot be guaranteed. Depths shown usually refer to the top of the service. Gravity sewer and drain depths are usually to invert (base of drainage channel) unless otherwise stated.

Some above ground features may have been obscured at time of survey. It is not always possible to operate the Ground Penetrating Radar in areas including, but not limited to, dense vegetation, rubble, debris and/or rough/uneven ground.

Existing record information that was made available to SEP by the Client or by the statutory utility provider should be regarded only as an indication and cannot be guaranteed.

Excavation in the vicinity of services shown should be carried out with due diligence (Ref. HSG47).

0 2m 4m 8m 12m 16m

SCALE BAR

REV	DATE	DESCRIPTION
A	10/22	End of trace query addressed.

SURVEY & ENGINEERING PROJECTS

Client
Quartz Project Services Limited
34 Dover Street
London
W1S 4NG

Project Title
Utility Survey of Land at:
North Farm Road
Tunbridge Wells
TN2 3DP

Surveyed	Drawn	Checked
L.Biggar	D.Shipton	L.Biggar

Scale	Date	Drawing Ref.	No.	Size	Rev
1:200	Sep 22	S23829-U	01	A0	A

Appendix E

Greenfield Runoff Rate Calculation

Print | Close Report

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Rebecca Reid
Site name:	8519
Site location:	North Farm Road, Tunbridge Wells

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	51.15140° N
Longitude:	0.27845° E
Reference:	1188160085
Date:	Feb 08 2023 14:44

Runoff estimation approach IH124

Site characteristics

Total site area (ha): 0.45

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics	Default	Edited
SAAR (mm):	780	780
Hydrological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates	Default	Edited
Q_{BAR} (l/s):	2.47	2.47
1 in 1 year (l/s):	2.1	2.1
1 in 30 years (l/s):	5.67	5.67
1 in 100 year (l/s):	7.87	7.87
1 in 200 years (l/s):	9.22	9.22

Appendix F

Microdrainage Preliminary Storage Volumes Calculations
1 in 1 year
1 in 30 year
1 in 100 year +40%

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow Σ (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	8.187	0.187	2.0	0.0	2.0	18.7	O K
30 min Summer	8.227	0.227	2.1	0.0	2.1	22.7	O K
60 min Summer	8.267	0.267	2.1	0.0	2.1	26.7	O K
120 min Summer	8.299	0.299	2.1	0.0	2.1	29.9	O K
180 min Summer	8.314	0.314	2.1	0.0	2.1	31.4	O K
240 min Summer	8.321	0.321	2.1	0.0	2.1	32.1	O K
360 min Summer	8.324	0.324	2.1	0.0	2.1	32.4	O K
480 min Summer	8.320	0.320	2.1	0.0	2.1	32.0	O K
600 min Summer	8.313	0.313	2.1	0.0	2.1	31.3	O K
720 min Summer	8.303	0.303	2.1	0.0	2.1	30.3	O K
960 min Summer	8.284	0.284	2.1	0.0	2.1	28.4	O K
1440 min Summer	8.245	0.245	2.1	0.0	2.1	24.5	O K
2160 min Summer	8.194	0.194	2.0	0.0	2.0	19.4	O K
2880 min Summer	8.156	0.156	1.9	0.0	1.9	15.6	O K
4320 min Summer	8.108	0.108	1.8	0.0	1.8	10.8	O K
5760 min Summer	8.087	0.087	1.6	0.0	1.6	8.7	O K
7200 min Summer	8.076	0.076	1.4	0.0	1.4	7.6	O K
8640 min Summer	8.068	0.068	1.3	0.0	1.3	6.8	O K
10080 min Summer	8.062	0.062	1.2	0.0	1.2	6.2	O K
15 min Winter	8.210	0.210	2.0	0.0	2.0	21.0	O K
30 min Winter	8.256	0.256	2.1	0.0	2.1	25.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	30.608	0.0	19.6	0.0	18
30 min Summer	19.291	0.0	24.8	0.0	32
60 min Summer	12.158	0.0	31.5	0.0	62
120 min Summer	7.663	0.0	39.7	0.0	108
180 min Summer	5.849	0.0	45.5	0.0	142
240 min Summer	4.829	0.0	50.1	0.0	174
360 min Summer	3.687	0.0	57.4	0.0	244
480 min Summer	3.044	0.0	63.2	0.0	314
600 min Summer	2.623	0.0	68.1	0.0	384
720 min Summer	2.323	0.0	72.4	0.0	450
960 min Summer	1.927	0.0	80.0	0.0	586
1440 min Summer	1.480	0.0	92.2	0.0	838
2160 min Summer	1.136	0.0	106.4	0.0	1208
2880 min Summer	0.942	0.0	117.6	0.0	1556
4320 min Summer	0.721	0.0	134.8	0.0	2248
5760 min Summer	0.596	0.0	148.8	0.0	2944
7200 min Summer	0.514	0.0	160.5	0.0	3672
8640 min Summer	0.456	0.0	170.7	0.0	4408
10080 min Summer	0.412	0.0	179.8	0.0	5136
15 min Winter	30.608	0.0	22.0	0.0	18
30 min Winter	19.291	0.0	27.8	0.0	32

Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow Σ (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
60 min Winter	8.304	0.304	2.1	0.0	2.1	30.4	O K
120 min Winter	8.344	0.344	2.1	0.0	2.1	34.4	O K
180 min Winter	8.358	0.358	2.1	0.0	2.1	35.8	O K
240 min Winter	8.365	0.365	2.1	0.0	2.1	36.5	O K
360 min Winter	8.365	0.365	2.1	0.0	2.1	36.5	O K
480 min Winter	8.354	0.354	2.1	0.0	2.1	35.4	O K
600 min Winter	8.339	0.339	2.1	0.0	2.1	33.9	O K
720 min Winter	8.321	0.321	2.1	0.0	2.1	32.1	O K
960 min Winter	8.287	0.287	2.1	0.0	2.1	28.7	O K
1440 min Winter	8.222	0.222	2.0	0.0	2.0	22.2	O K
2160 min Winter	8.151	0.151	1.9	0.0	1.9	15.1	O K
2880 min Winter	8.109	0.109	1.8	0.0	1.8	10.9	O K
4320 min Winter	8.078	0.078	1.4	0.0	1.4	7.8	O K
5760 min Winter	8.065	0.065	1.2	0.0	1.2	6.5	O K
7200 min Winter	8.057	0.057	1.0	0.0	1.0	5.7	O K
8640 min Winter	8.053	0.053	0.9	0.0	0.9	5.3	O K
10080 min Winter	8.049	0.049	0.8	0.0	0.8	4.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
60 min Winter	12.158	0.0	35.3	0.0	60
120 min Winter	7.663	0.0	44.5	0.0	116
180 min Winter	5.849	0.0	51.0	0.0	164
240 min Winter	4.829	0.0	56.2	0.0	188
360 min Winter	3.687	0.0	64.3	0.0	268
480 min Winter	3.044	0.0	70.8	0.0	344
600 min Winter	2.623	0.0	76.3	0.0	416
720 min Winter	2.323	0.0	81.1	0.0	490
960 min Winter	1.927	0.0	89.7	0.0	626
1440 min Winter	1.480	0.0	103.3	0.0	882
2160 min Winter	1.136	0.0	119.2	0.0	1236
2880 min Winter	0.942	0.0	131.7	0.0	1560
4320 min Winter	0.721	0.0	151.1	0.0	2248
5760 min Winter	0.596	0.0	166.7	0.0	2944
7200 min Winter	0.514	0.0	179.8	0.0	3672
8640 min Winter	0.456	0.0	191.2	0.0	4360
10080 min Winter	0.412	0.0	201.4	0.0	5136

Rainfall Details

Rainfall Model	FEH	D2 (1km)	0.349	Cv (Summer)	0.750
Return Period (years)	1	D3 (1km)	0.339	Cv (Winter)	0.840
FEH Rainfall Version	1999	E (1km)	0.311	Shortest Storm (mins)	15
Site Location		F (1km)	2.498	Longest Storm (mins)	10080
C (1km)	-0.023	Summer Storms	Yes	Climate Change %	+0
D1 (1km)	0.334	Winter Storms	Yes		

Time Area Diagram

Total Area (ha) 0.347

Time (mins) From:	To:	Area (ha)
0	4	0.347

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow Σ (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	8.595	0.595	5.7	0.0	5.7	59.5	O K
30 min Summer	8.685	0.685	5.7	0.0	5.7	68.5	O K
60 min Summer	8.761	0.761	5.7	0.0	5.7	76.1	O K
120 min Summer	8.790	0.790	5.7	0.0	5.7	79.0	O K
180 min Summer	8.782	0.782	5.7	0.0	5.7	78.2	O K
240 min Summer	8.766	0.766	5.7	0.0	5.7	76.6	O K
360 min Summer	8.727	0.727	5.7	0.0	5.7	72.7	O K
480 min Summer	8.682	0.682	5.7	0.0	5.7	68.2	O K
600 min Summer	8.630	0.630	5.7	0.0	5.7	63.0	O K
720 min Summer	8.575	0.575	5.7	0.0	5.7	57.5	O K
960 min Summer	8.483	0.483	5.7	0.0	5.7	48.3	O K
1440 min Summer	8.336	0.336	5.7	0.0	5.7	33.6	O K
2160 min Summer	8.204	0.204	5.5	0.0	5.5	20.4	O K
2880 min Summer	8.142	0.142	5.2	0.0	5.2	14.2	O K
4320 min Summer	8.105	0.105	4.1	0.0	4.1	10.5	O K
5760 min Summer	8.089	0.089	3.4	0.0	3.4	8.9	O K
7200 min Summer	8.080	0.080	2.9	0.0	2.9	8.0	O K
8640 min Summer	8.073	0.073	2.5	0.0	2.5	7.3	O K
10080 min Summer	8.068	0.068	2.2	0.0	2.2	6.8	O K
15 min Winter	8.671	0.671	5.7	0.0	5.7	67.1	O K
30 min Winter	8.775	0.775	5.7	0.0	5.7	77.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	97.680	0.0	63.3	0.0	18
30 min Summer	58.329	0.0	75.7	0.0	33
60 min Summer	34.831	0.0	90.5	0.0	62
120 min Summer	20.799	0.0	108.2	0.0	118
180 min Summer	15.384	0.0	120.0	0.0	146
240 min Summer	12.420	0.0	129.2	0.0	178
360 min Summer	9.187	0.0	143.3	0.0	248
480 min Summer	7.417	0.0	154.3	0.0	318
600 min Summer	6.282	0.0	163.4	0.0	386
720 min Summer	5.486	0.0	171.2	0.0	448
960 min Summer	4.448	0.0	185.1	0.0	576
1440 min Summer	3.310	0.0	206.6	0.0	808
2160 min Summer	2.463	0.0	230.7	0.0	1148
2880 min Summer	1.997	0.0	249.4	0.0	1476
4320 min Summer	1.480	0.0	277.2	0.0	2204
5760 min Summer	1.197	0.0	299.0	0.0	2936
7200 min Summer	1.015	0.0	316.9	0.0	3672
8640 min Summer	0.887	0.0	332.3	0.0	4344
10080 min Summer	0.791	0.0	345.9	0.0	5136
15 min Winter	97.680	0.0	71.0	0.0	18
30 min Winter	58.329	0.0	84.8	0.0	32

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow Σ (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
60 min Winter	8.864	0.864	5.7	0.0	5.7	86.4	O K
120 min Winter	8.910	0.910	5.7	0.0	5.7	91.0	O K
180 min Winter	8.897	0.897	5.7	0.0	5.7	89.7	O K
240 min Winter	8.876	0.876	5.7	0.0	5.7	87.6	O K
360 min Winter	8.820	0.820	5.7	0.0	5.7	82.0	O K
480 min Winter	8.752	0.752	5.7	0.0	5.7	75.2	O K
600 min Winter	8.677	0.677	5.7	0.0	5.7	67.7	O K
720 min Winter	8.585	0.585	5.7	0.0	5.7	58.5	O K
960 min Winter	8.437	0.437	5.7	0.0	5.7	43.7	O K
1440 min Winter	8.237	0.237	5.6	0.0	5.6	23.7	O K
2160 min Winter	8.127	0.127	5.0	0.0	5.0	12.7	O K
2880 min Winter	8.104	0.104	4.1	0.0	4.1	10.4	O K
4320 min Winter	8.083	0.083	3.0	0.0	3.0	8.3	O K
5760 min Winter	8.072	0.072	2.5	0.0	2.5	7.2	O K
7200 min Winter	8.065	0.065	2.1	0.0	2.1	6.5	O K
8640 min Winter	8.060	0.060	1.8	0.0	1.8	6.0	O K
10080 min Winter	8.056	0.056	1.6	0.0	1.6	5.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
60 min Winter	34.831	0.0	101.4	0.0	60
120 min Winter	20.799	0.0	121.1	0.0	116
180 min Winter	15.384	0.0	134.4	0.0	166
240 min Winter	12.420	0.0	144.7	0.0	188
360 min Winter	9.187	0.0	160.5	0.0	266
480 min Winter	7.417	0.0	172.8	0.0	344
600 min Winter	6.282	0.0	183.0	0.0	422
720 min Winter	5.486	0.0	191.8	0.0	486
960 min Winter	4.448	0.0	207.3	0.0	606
1440 min Winter	3.310	0.0	231.4	0.0	824
2160 min Winter	2.463	0.0	258.4	0.0	1124
2880 min Winter	1.997	0.0	279.3	0.0	1472
4320 min Winter	1.480	0.0	310.5	0.0	2184
5760 min Winter	1.197	0.0	334.8	0.0	2936
7200 min Winter	1.015	0.0	354.9	0.0	3592
8640 min Winter	0.887	0.0	372.2	0.0	4312
10080 min Winter	0.791	0.0	387.4	0.0	5136

Rainfall Details

Rainfall Model	FEH	D2 (1km)	0.349	Cv (Summer)	0.750
Return Period (years)	30	D3 (1km)	0.339	Cv (Winter)	0.840
FEH Rainfall Version	1999	E (1km)	0.311	Shortest Storm (mins)	15
Site Location		F (1km)	2.498	Longest Storm (mins)	10080
C (1km)	-0.023	Summer Storms	Yes	Climate Change %	+0
D1 (1km)	0.334	Winter Storms	Yes		

Time Area Diagram

Total Area (ha) 0.347

Time (mins) From:	To:	Area (ha)
0	4	0.347

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow Σ (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	8.616	0.616	7.9	0.0	7.9	129.3	O K
30 min Summer	8.705	0.705	7.9	0.0	7.9	148.0	O K
60 min Summer	8.786	0.786	7.9	0.0	7.9	165.1	O K
120 min Summer	8.839	0.839	7.9	0.0	7.9	176.2	O K
180 min Summer	8.841	0.841	7.9	0.0	7.9	176.7	O K
240 min Summer	8.830	0.830	7.9	0.0	7.9	174.4	O K
360 min Summer	8.802	0.802	7.9	0.0	7.9	168.5	O K
480 min Summer	8.770	0.770	7.9	0.0	7.9	161.8	O K
600 min Summer	8.736	0.736	7.9	0.0	7.9	154.7	O K
720 min Summer	8.701	0.701	7.9	0.0	7.9	147.2	O K
960 min Summer	8.627	0.627	7.9	0.0	7.9	131.6	O K
1440 min Summer	8.490	0.490	7.9	0.0	7.9	102.9	O K
2160 min Summer	8.335	0.335	7.9	0.0	7.9	70.5	O K
2880 min Summer	8.236	0.236	7.8	0.0	7.8	49.5	O K
4320 min Summer	8.146	0.146	7.3	0.0	7.3	30.7	O K
5760 min Summer	8.121	0.121	6.0	0.0	6.0	25.4	O K
7200 min Summer	8.106	0.106	5.1	0.0	5.1	22.3	O K
8640 min Summer	8.096	0.096	4.4	0.0	4.4	20.2	O K
10080 min Summer	8.089	0.089	4.0	0.0	4.0	18.7	O K
15 min Winter	8.693	0.693	7.9	0.0	7.9	145.5	O K
30 min Winter	8.793	0.793	7.9	0.0	7.9	166.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	207.486	0.0	134.1	0.0	18
30 min Summer	121.522	0.0	157.2	0.0	33
60 min Summer	71.173	0.0	184.8	0.0	62
120 min Summer	41.685	0.0	216.5	0.0	122
180 min Summer	30.484	0.0	237.5	0.0	178
240 min Summer	24.414	0.0	253.7	0.0	204
360 min Summer	17.854	0.0	278.3	0.0	268
480 min Summer	14.299	0.0	297.2	0.0	336
600 min Summer	12.037	0.0	312.7	0.0	406
720 min Summer	10.457	0.0	326.0	0.0	476
960 min Summer	8.411	0.0	349.7	0.0	608
1440 min Summer	6.188	0.0	385.8	0.0	864
2160 min Summer	4.553	0.0	426.3	0.0	1212
2880 min Summer	3.662	0.0	457.1	0.0	1556
4320 min Summer	2.684	0.0	502.2	0.0	2204
5760 min Summer	2.152	0.0	537.6	0.0	2936
7200 min Summer	1.814	0.0	566.2	0.0	3672
8640 min Summer	1.577	0.0	590.7	0.0	4400
10080 min Summer	1.401	0.0	612.1	0.0	5136
15 min Winter	207.486	0.0	150.2	0.0	18
30 min Winter	121.522	0.0	176.1	0.0	33

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow Σ (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
60 min Winter	8.888	0.888	7.9	0.0	7.9	186.5	O K
120 min Winter	8.956	0.956	7.9	0.0	7.9	200.8	O K
180 min Winter	8.967	0.967	7.9	0.0	7.9	203.1	O K
240 min Winter	8.955	0.955	7.9	0.0	7.9	200.6	O K
360 min Winter	8.917	0.917	7.9	0.0	7.9	192.5	O K
480 min Winter	8.873	0.873	7.9	0.0	7.9	183.4	O K
600 min Winter	8.824	0.824	7.9	0.0	7.9	173.1	O K
720 min Winter	8.773	0.773	7.9	0.0	7.9	162.3	O K
960 min Winter	8.666	0.666	7.9	0.0	7.9	139.9	O K
1440 min Winter	8.444	0.444	7.9	0.0	7.9	93.3	O K
2160 min Winter	8.237	0.237	7.8	0.0	7.8	49.7	O K
2880 min Winter	8.148	0.148	7.3	0.0	7.3	31.1	O K
4320 min Winter	8.112	0.112	5.5	0.0	5.5	23.5	O K
5760 min Winter	8.096	0.096	4.4	0.0	4.4	20.1	O K
7200 min Winter	8.086	0.086	3.7	0.0	3.7	18.0	O K
8640 min Winter	8.079	0.079	3.2	0.0	3.2	16.5	O K
10080 min Winter	8.073	0.073	2.9	0.0	2.9	15.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
60 min Winter	71.173	0.0	207.0	0.0	62
120 min Winter	41.685	0.0	242.5	0.0	118
180 min Winter	30.484	0.0	266.1	0.0	174
240 min Winter	24.414	0.0	284.2	0.0	226
360 min Winter	17.854	0.0	311.7	0.0	282
480 min Winter	14.299	0.0	332.9	0.0	360
600 min Winter	12.037	0.0	350.3	0.0	438
720 min Winter	10.457	0.0	365.2	0.0	514
960 min Winter	8.411	0.0	391.7	0.0	666
1440 min Winter	6.188	0.0	432.2	0.0	908
2160 min Winter	4.553	0.0	477.5	0.0	1232
2880 min Winter	3.662	0.0	512.0	0.0	1500
4320 min Winter	2.684	0.0	562.5	0.0	2204
5760 min Winter	2.152	0.0	602.1	0.0	2928
7200 min Winter	1.814	0.0	634.2	0.0	3648
8640 min Winter	1.577	0.0	661.7	0.0	4376
10080 min Winter	1.401	0.0	685.6	0.0	5120

Rainfall Details

Rainfall Model	FEH	D2 (1km)	0.349	Cv (Summer)	0.750
Return Period (years)	100	D3 (1km)	0.339	Cv (Winter)	0.840
FEH Rainfall Version	1999	E (1km)	0.311	Shortest Storm (mins)	15
Site Location		F (1km)	2.498	Longest Storm (mins)	10080
C (1km)	-0.023	Summer Storms	Yes	Climate Change %	+40
D1 (1km)	0.334	Winter Storms	Yes		

Time Area Diagram

Total Area (ha) 0.347

Time (mins) From:	To:	Area (ha)
0	4	0.347

Appendix G

Proposed Drainage Principles - Schematic

8519 TUNBRIDGE WELLS

16/02/2023

PROPOSED PRELIMINARY DRAINAGE STRATEGY - PLANNING STAGE

EXISTING ADOPTED 225mm DIA. SURFACE WATER SEWER TAKEN FROM RECORDS

EXISTING ADOPTED 150mm DIA. FOUL WATER SEWER TAKEN FROM RECORDS

EXISTING PRIVATE 150mm DIA. SURFACE WATER DRAIN WITHIN SITE TAKEN FROM SITE TOPO. SURVEY

EXISTING PRIVATE 150mm DIA. FOUL WATER DRAIN WITHIN SITE TAKEN FROM SITE TOPO. SURVEY

PROPOSED PRIVATE SURFACE WATER DRAIN SERVING DEVELOPED SITE. CONNECTS TO DOWNSTREAM ADOPTED MANHOLE 4551.

PROPOSED PRIVATE 150mm DIA. FOUL WATER DRAIN SERVING DEVELOPED SITE. CONNECTS TO DOWNSTREAM ADOPTED MANHOLE 5601.

0m 4m 8m 12m 16m 20m

1:200 @ A1 1:400 @ A3

CHAPMAN L...

FOUL WATER
ASSUMED DIRECTION OF EXISTING 150mm SITE FOUL WATER CONNECTION TO ADOPTED SEWER, TAKEN FROM SITE TOPO SURVEY. IL UNKNOWN. PROPOSE TO RE-USE ROUTE FOR NEW SITE FOUL WATER CONNECTION TO ADOPTED SEWER AT MANHOLE 5601.
PROPOSED PEAK FLOW RATE = **1.51 l/sec.**
CONDITION AND LEVEL OF EXISTING DRAIN TO ADOPTED MH 5601 TO BE INVESTIGATED FOR PURPOSES OF RE-USE.

MH 5601
CL 78.88
IL 75.83

SW SEWER CHANGES TO 450mm DIA AT MH 5651

MH 5651
CL 79.07
IL 76.16

Secure fenceline

Line of lower level below

8 no. cycle spaces

19 parking spaces (including 2 disabled)

3 unloading bays

Secure fencline & sliding vehicular access gate

PROPOSED LOWER GROUND FFL = 80.25

PROPOSED GROUND FLOOR FFL = 83.75

STORAGE 2070.5 m²

EXISTING 150mm DIA. SW PIPE TAKEN FROM TOPO SURVEY. IL = 79.47m

ASSUMED DIRECTION OF EXISTING 150mm SITE SURFACE WATER CONNECTION TO ADOPTED SEWERS. IL UNKNOWN

MH 4550
CL 80.31 (TAKEN FROM TOPO)
IL UNKNOWN

UNABLE TO PUSH SONDE BEYOND THIS POINT

80.00m TOP OF PIPE

NORTH FARM ROAD

EXISTING 150mm DIA. FW PIPE TAKEN FROM TOPO. LEVELS TAKEN FROM TOPO

81.30m TOP OF PIPE

81.05m TOP OF PIPE

BIN STORE 22.1 m²

DIS WC 4.4 m²

WC 4.4 m²

SHOWER 8.6 m²

STAFF ROOM 14.9 m²

OFFICE 38.0 m²

UNLOADING BAY 47.2 m²

RECEPTION 66.6 m²

UP

DN

SW ATTENUATION WITHIN CAR PARK
ATTENUATION VOLUME FOR 1 IN 100 YEAR STORM PLUS 40% ALLOWANCE FOR CLIMATE CHANGE = 203.1m3

ADOPTED FW DRAINAGE PRESENT WITHIN BALDWINS LANE , COVER AND INVERT LEVELS UNKNOWN. ASSUME TOO HIGH TO CONNECT TO BASED ON DOWNSTREAM LEVELS AT ADOPTED MANHOLE 4501 (IL 83.87)

SURFACE WATER
CREATE NEW SURFACE WATER CONNECTION FROM SITE ATTENUATION WITHIN CAR PARK TO ADOPTED MANHOLE 4551 WITHIN NORTH FARM ROAD. DISCHARGE RATE TO BE RESTRICTED TO GREENFIELD RUNOFF RATES:
1 IN 1 YEAR = 2.10 l/sec
1 IN 30 YEAR = 5.67 l/sec
1 IN 100 YR +40% CC = **7.87 l/sec**
ATTENUATION VOLUME FOR 1 IN 100 YEAR STORM PLUS 40% ALLOWANCE FOR CLIMATE CHANGE = 203.1m3.

MH 4551
CL 82.92 (TAKEN FROM TOPO)
IL UNKNOWN - TBC ON SITE IN ORDER TO VERIFY NEW CONNECTION

SURFACE WATER RUNOFF TREATMENT

ROOF: CATCHPITS AT BASE OF DOWNPIPES

CAR PARK: BYPASS SEPARATOR

By Room Name Legend

- BIN STORE
- COMMS
- DIS WC
- OFFICE
- RECEPTION
- SHOWER
- STAFF ROOM
- STORAGE
- UNLOADING BAY
- WC

Indicative storage layout subject to subconsultant review. Fire strategy to be reviewed by fire consultant.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, refer to Designers Risk Assessment, note the following :

DRAFT 03/02/23

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

Use Dimensions - DO NOT SCALE

Contractors Must Verify All Dimensions On Site Before Starting Work

Rev	Date	Version Description	Drn	Chk

Client Logo

DMWR Architects
16-18 Hatton Garden
First Floor
London EC1N 8AT

Client
COMPOUND RE

Project Name
North Farm Road, Tumbridge Wells
North Farm Road, Tumbridge Wells

Drawing Title
Proposed Site Plan

Drawing Status	North
PRELIMINARY	
Drawing Details	DMWR Job No. 3940
Drawn By: CC / Drawn Date: 11/22/22 / Checked By: AB	Scale @ A1: 1 : 200
Drawing Number: 3940-DMWR-SK-A-10	Status Revision

ISO A1 Landscape

Appendix H

Surface Water Drainage Maintenance Plan

8519 Tunbridge Wells
Proposed re-development of brownfield site to self-storage facility
Surface Water Drainage Maintenance Plan – March 2023

The following surface water management plan applies to the development of a three/four storey self-storage facility at the following address: Tunbridge Wells MOT Centre and the Former Oil Distribution Depot, North Farm Road, Tunbridge Wells, Kent, TN2 3DP.

The underground surface water drainage within the site boundary will be maintained by the building occupier. All proprietary systems will be maintained in accordance with manufacturer's recommendations. The current recommendations, where appropriate, are included below. However, the guidance provided below should be reviewed as and when manufacturer's guidance is updated. All installation and maintenance guides for proprietary systems will be retained on the premises in the Health & Safety file.

In addition to the following guidance on the underground drainage system, the above ground roof rainwater drainage system should be maintained strictly in accordance with the designer's guidance to ensure that roof run-off is conveyed in to the underground system as intended.

Gullies

Road gullies draining the site hardstandings should be inspected regularly to ensure that they continue to operate effectively, and are free from damage and blockage by debris or solid objects.

They should be cleaned at least once a year, and incorporated into a planned maintenance schedule.

Any debris or blockages near to the surface of the gully should be removed by hand or by jet-vac. The trap element of the gully can be cleaned through the use of a high-pressure hose.

The seating areas for grates should be cleaned before they are replaced. If grates are allowed to move within their frame, this may cause damage to the frame or seating.

Drainage channels

Drainage channels should be inspected regularly to ensure that the system continues to operate effectively, and is free from damage and blockage by debris or solid objects.

The system should be cleaned at least once a year, and incorporated into a planned maintenance schedule.

Channel units can be cleaned through the use of a high-pressure hose. This can be fed into the channel system through access units which are strategically placed along the channel run.

The throat section of channel units should be kept clear at all times to ensure uninterrupted flow of surface liquids into the drainage channel. Any debris within the throat should be removed.

The seating areas for covers and grates should be cleaned before they are replaced. The covers and grates should be locked into position to prevent these being removed, stolen or dislodged by traffic. Locking bolts should be replaced and sufficiently tightened, taking care that the bolt heads do not stand above the top surface of the cover or grate. If grates/ covers are allowed to move within their frame, this may cause damage to the frame or seating.

Pipes and manholes

Manholes are to be inspected annually for signs of blockage, with pipes jet washed and CCTV inspections carried out to the pipelines as appropriate should a blockage occur.

Petrol interceptor

The bypass interceptor will be installed with an alarm, which is activated when 90% of the oil storage volume of the interceptor has been reached. This notifies the occupant that the unit is required to be emptied. Should the interceptor fail to be emptied at this time, excessive oil could pass through the interceptor, thus polluting the downstream environment.

The interceptor should be serviced in accordance with the manufacturer's recommended service interval in order to ensure proper operation of the equipment. This should be done routinely without waiting for the alarm to sound. The on-going functional assessment of the unit and oil alarm systems is fundamental if pollution incidents are to be avoided.

The removal of sediment and retained oil/grease should be carried out by a contractor holding the relevant permits to transport and dispose of such waste.

Contaminated surface water can contain substances harmful to human health. Any person carrying out maintenance on the equipment should wear suitable protective clothing, including gloves. Good hygiene practice should also be observed.

Attenuation tank

The steel corrugated pipe attenuation tank is equipped with access manholes at each inlet and outlet location.

The tank should be maintained in a similar manner to the network of pipes and manholes. It is to be inspected bi-annually for signs of build-up or blockages, with CCTV inspections used appropriately to identify the source and location. Any sediment build-up at inlet or outlet locations should be removed by Jetvac. Entry to the tank should be carried out by someone who has successfully completed a confined space training course. The fabric of the tank itself requires no maintenance, and has a minimum design life of 60 years.

The flow control device located within the tank is also to be checked bi-annually for blockages.

General guidance for the safe inspection of underground systems and confined spaces

- Contaminated surface water can contain substances harmful to human health. Any person carrying out maintenance on equipment which could potentially contain contaminated water should wear suitable protective clothing, including gloves. Good hygiene practice should also be observed.
- When covers are removed precautions should be taken against personnel falling into the unit.
- The working area should be adequately lit and the inspector should be familiar with the area and access points
- Correct posture should be maintained, particularly when lifting. Appropriate lifting equipment should be used when necessary. Proper footing and balance should be maintained at all times, taking care to avoid any sharp edges.

Appendix I

Kent County Council LLFA – Drainage Strategy Summary Form

Appendix C. Drainage Strategy Summary

1. Site details	
Site/development name	MJM PROJECT REF: 8519. DEMOLITION OF A CAR SALES/VEHICLE REPAIR BUSINESS AND ERECTION OF REPLACEMENT SELF-STORAGE UNIT (CLASS B8 USE) WITH ASSOCIATED PARKING AND LANDSCAPING.
Address including post code	TUNBRIDGE WELLS MOT CENTRE AND THE FORMER OIL DISTRIBUTION DEPOT, NORTH FARM ROAD, TUNBRIDGE WELLS, KENT, TN2 3DP
Grid reference	E 559429 N 141573
LPA reference	N/A
Type of application	Outline ☐ Full X Discharge of Conditions ☐ Other ☐
Site condition	Greenfield ☐ Brownfield X

2. Existing drainage			Document/Plan where information is stated:
Total site area (ha)	0.479 ha		EXISTING SITE TOPOGRAPHIC SURVEY INC. UNDERGROUND UTILITIES MAPPING - APPENDIX D OF FRA SOUTHERN WATER ASSET SEARCH - APPENDIX C OF FRA
Impermeable area (ha)	0.450 ha		
Final discharge location	Infiltration ☐ Watercourse ☐ Sewer X Tidal reach/sea ☐		
Greenfield discharge rate (l/s) for existing site area	QBAR (l/s)	2.47 l/sec	GREENFIELD RUNOFF CALCULATION - APPENDIX E OF FRA
	1 in 1 year (l/s)	2.10 l/sec	
	1 in 30 year (l/s)	5.67 l/sec	
	1 in 100 year (l/s)	7.87 l/sec	

3. Proposed drainage areas			Document/Plan where information is stated:
Impermeable area (ha)	Roof	0.250 ha	ARCHITECTS PROPOSED SITE PLAN - APPENDIX A OF FRA
	Highway/road	None	
	Other paved areas	0.097 ha	
	Total	0.347 ha	
Permeable area (ha)	Open space	0.103 ha	
	Other permeable areas	None	
	Total	0.103 ha	
Final discharge location	Infiltration ☐ Infiltration rate _____ m/s Watercourse ☐ Sewer X Tidal reach/sea ☐		SOUTHERN WATER ASSET SEARCH - APPENDIX C OF FRA PROPOSED DRAINAGE PRINCIPLES SCHEMATIC - APPENDIX G OF FRA
Climate change allowance included in design	20% ☐ 30% ☐ 40% X		PROPOSED DRAINAGE PRINCIPLES SCHEMATIC - APPENDIX G OF FRA PRELIMINARY STORAGE VOLUMES CALCULATIONS - APPENDIX F OF FRA

4. Post-Development Discharge rates, without mitigation			**Document/Plan where information is stated:**
Developed discharge rates (l/s)	1 in 1 year	32.4 l/sec	
	1 in 30 year	129.9 l/sec	
	1 in 100 year	201.5 l/sec	
	1 in 100 year + CC	292.3 l/sec	
5. Post-Development Discharge rates, with mitigation			**Document/Plan where information is stated:**
Describe development drainage strategy in general terms: ROOF RAINWATER PIPES TO CONNECT INTO UNDERGROUND NETWORK OF PIPES AND MANHOLES VIA CATCHPITS. HARDSTANDING TO CAR PARK TO BE DRAINED BY GULLIES AND DRAINAGE CHANNELS AND TREATED BY BYPASS SEPARATOR. ALL RUN OFF TO BE COLLECTED IN UNDERGROUND ATTENUATION TANK WITHIN CAR PARK AREA, PRIOR TO DISCHARGE AT CONTROLLED RATE (GREENFIELD) INTO NEARBY ADOPTED SURFACE WATER SEWER (AS EXISTING DISCHARGE ROUTE). ATTENUATION TO BE DESIGNED FOR 1 IN 100 YR RETURN PERIOD STORM, WITH ADDITIONAL 40% ALLOWANCE FOR CLIMATE CHANGE.			PROPOSED DRAINAGE PRINCIPLES SCHEMATIC - APPENDIX G OF FRA
(a) No control required, all flows infiltrating ☐			
(b) Controlled developed discharge rates (l/s)	1 in 1 year	2.10 l/sec	PROPOSED DRAINAGE PRINCIPLES SCHEMATIC - APPENDIX G OF FRA
	1 in 30 year	5.67 l/sec	
	1 in 100 year	7.87 l/sec	
	1 in 100 year + CC	7.87 l/sec	

6. Discharge Volumes			**Document/Plan where information is stated:**
	Existing volume (m^3)	Proposed volume (m^3)	
1 in 1 year	248.3 m3	201.4 m3	PROPOSED CALCULATIONS INCLUDED IN PRELIMINARY STORAGE VOLUMES CALCULATIONS - APPENDIX F OF FRA
1 in 30 year	470.7 m3	387.4 m3	
1 in 100 year	595.7 m3	489.9 m3	
1 in 100 year + CC	849.0 m3	685.6 m3	

All information presented above should be contained within the attached Flood Risk Assessment, Drainage Strategy or Statement and be substantiated through plans and appropriate calculations.

Form completed by	Rebecca Reid
Qualifications	MEng CEng MIStructE
Company	MJM Consulting Engineers Ltd
Telephone	01924 811000
Email	[redacted]
On behalf of (client's details)	CSS TW Asset Limited
Date	21/03/2023